STATEMENT OF BASIS
ST. GEORGE CITY
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER
UPDES PERMIT NUMBER: UT0024686
UPDES BIOSOLIDS PERMIT NUMBER: UTL-024686
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR000000
MAJOR MUNICIPAL

FACILITY CONTACTS

Person Name:	Ben Ford	Person Name:	Eric Richens
Position:	General Manager	Position:	Biosolids Coordinator
Person Name:	Dan Morrison	Person Name:	Leslie Wentland
Position:	Pretreatment Coordinator	Position:	Laboratory Director

Facility Name:	St. George City
Mailing Address:	3780 South 1550 West St. George, Utah 844770
Telephone:	(435) 634-5849

DESCRIPTION OF FACILITY

St. George Regional water reclamation facility (SGWRF) began discharging in 1990 with a 5 MGD design capacity, was upgraded in 1994 to an 8.5 MGD capacity, and the latest upgrade was completed in 1999 bringing the plant design capacity to an average daily flow of 17 MGD. This treatment plant is serving St. George and the surrounding areas of Ivins, Santa Clara and Washington.

Treatment facilities consist of four 54 inch influent screw pumps, two submersible pumps, two mechanical bar screens, two air lift grit chambers, one bio selector, four oxidation ditches, six clarifiers, two low pressure ultraviolet disinfection systems, one medium pressure ultraviolet disinfection system, and two cascade aeration systems. Sludge is currently wasted from the clarifiers into two gravity thickeners. The sludge is then transferred to the post authothermal thermophilic aerobic digestion (ATAD) holding tank and then pumped into the solids building feeding two centrifuges for de-watering purposes. The sludge is transported to the County Landfill for composting, which produces a Class A sludge.

The treatment plant has two discharge points, a 27 inch pipe and a 48 inch pipe located adjacent to each other. Both discharge points discharge on the southeast side of the treatment plant, the north bank of the Virgin River, approximately one and one half miles (1.5 miles) southwest of where the Virgin River crosses under the I-15 Interstate Highway, in Washington County, Utah, at approximate latitude 37° 02' 16" and longitude 113° 37' 50", with outfall STORET Number 495006.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

In an effort to better address the needs of the watershed and increase efficiency, the DWQ has recently begun consolidating permits. Therefore, in addition to the discharge provisions, the renewal permit for SGWRF will include provisions for storm water and pretreatment. A biosolids permit will be issued to Red Rock, which processes the biosolids from SGWRF.

SGWRF will be required to continue to sample for silver although a reduction in frequency due to compliance history will decrease from monthly to quarterly. The limit for silver is more stringent than the previous permit due to a new wasteload analysis (WLA).

Ammonia limit has changed due to a new WLA.

SGWRF is required to comply with the Colorado River Basin Salinity Forum (Forum) policies, as per UAC R317-2-4. On October 29, 1996 SGWRF submitted to DWQ a TDS demonstration which stated that SGWRF was unable to meet the 400 mg/L incremental increase requirement of the Forum and were subsequently given a variance. Although SGWRF must:

1. Continue monitoring and reporting both the influent and effluent TDS.
2. Continue to minimize the groundwater entering into the collection system as practicable through appropriate operation and maintenance procedures,
3. Through written communication, encourage those systems discharging into the system to undertake measures to minimize the groundwater entering their systems and report to SGWRF on the same
4. Through written communication, and any other suitable means, encourage appropriate dischargers to the system to minimize their TDS loadings through good housekeeping procedures.
5. Submit, with the next renewal application, a report summarizing efforts taken to undertake item 2, 3 and 4 above stating the average TDS level each year, and discuss the reasons for any increase in the average TDS level.

DISCHARGE

DESCRIPTION OF DISCHARGE

The SGWRF has been reporting self-monitoring results on Discharge Monitoring Reports (DMRs) on a monthly basis. A summary of the last 3 years of data is attached.

Outfall	Description of Discharge Point
001	The 27 inch discharge pipe is located on the southeast side of the treatment plant, about 400 feet from the north bank of the Virgin River, approximately one and one half (1.5) miles southwest of where the Virgin River crosses under the I-15 Interstate Highway, in Washington County, Utah at approximate latitude 37°02'16" and longitude 113°37'50".
002	The 48 inch pipe lies adjacent to the 27 inch pipe and is located on the southeast side of the treatment plant, about 400 feet from the north bank of the Virgin River, approximately one and one half (1.5) miles southwest of where the Virgin River

crosses under the I-15 Interstate Highway, in Washington County, Utah at approximate latitude 37°02'16" and longitude 113°37'50".

RECEIVING WATERS AND STREAM CLASSIFICATION

The discharge flows directly into the Virgin River which is Class 2B, 3B, and 4, according to *Utah Administrative Code (UAC) R317-2-13*:

Class 2B -Protected for secondary contact recreation such as boating, wading, or similar uses.

Class 3B -Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

Class 4 -Protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS

Limitations on total suspended solids (TSS), E-coli, pH and percent removal for BOD_5 and TSS are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The oil and grease is based on best professional judgment (BPJ).

BOD_5 is based on limits in the pervious permit's WLA.

WET, ammonia, dissolved oxygen (DO) and silver (Ag) limits are water quality limited and based on the WLA which is appended.

The receiving stream, the Virgin River, has a total maximum daily limit (TMDL) for total dissolved solids. Based on a new site specific TDS criteria set for this segment, the new wasteload for SGWRF will be 61,065 tons/year. That was calculated using the current plant design capacity of 17 MGD and the new TDS criteria of 2,360 mg/L. Since the WLA has a more stringent limit the WLA limit will be used for an effluent limit.

The permit limitations are:

Parameter	Effluent Limitations			
	Maximum Monthly Average	Maximum Weekly Average	Daily Minimum	Daily Maximum
BOD_5, mg/L BOD_5 Min. % Removal	17 85	24 NA	NA NA	NA NA
TSS, mg/L TSS Min. % Removal	25 85	35 NA	NA NA	NA NA
E-coli	126	158	NA	NA
DO	NA	NA	5.5	NA
Ammonia, mg/L as N	4.7	NA	NA	12.6
WET, Acute Biomonitoring	NA	NA	NA	Pass
Oil & Grease, mg/L	NA	NA	NA	10
Silver, mg/L	NA	NA	NA	0.0342
Total Dissolved Solids	NA	NA	NA	1,916
pH, Standard Units	NA	NA	6.5	9.0

NA – Not Applicable.

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same as in the previous permit. The permit will require reports to be submitted monthly and quarterly, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Lab sheets for biomonitoring must be attached to the biomonitoring DMR. Lab sheets for metals and toxic organics must be attached to the quarterly DMRs.

Self-Monitoring and Reporting Requirements			
Parameter	Frequency	Sample Type	Units
Total Flow	Continuous	Recorder	MGD
BOD_5, Influent Effluent	5 X Weekly 5 X Weekly	Composite Composite	mg/L mg/L
TSS, Influent Effluent	5 X Weekly 5 X Weekly	Composite Composite	mg/L mg/L
E-coli	5 X Weekly	Grab	mg/L
DO	5 X Weekly	Grab	mg/L
Ammonia (as N)	4 X Weekly	Grab	mg/L
WET, Acute Biomonitoring	Quarterly	Composite	Pass/Fail
Oil & Grease	Monthly	Grab	mg/L
Silver	Quarterly	Composite	mg/L
TDS	Monthly	Grab	mg/L
pH	5 X Weekly	Grab	SU
Metals, Influent Effluent	Quarterly Quarterly	Composite Composite	mg/L mg/L
Organic Toxics	Semi-annually	Grab	mg/L

BIOSOLIDS (SEWAGE SLUDGE)

DESCRIPTION OF TREATMENT AND DISPOSAL

The St. George Water Reclamation Facility (SGWRF) stabilizes the solids with an oxidation ditch which has mean cell resident time of about 20 days. After the solids are stabilized the solids are dewatered with centrifuges to about sixteen percent solids. In 2005, the SGWRF produced 1,897 dry metric tons (DMT) of solids that were hauled to the Washington County Landfill (WCL) where the WCL personnel mixed 3,414 DMT of green waste and wood chips with the solids for a total of 5,311 DMT. This mixture is formed into windrows and the "process to further reduce pathogens" (PFRP) is begun. Once the derived material (compost) has met the EPA and State requirements of *40 CFR 503* for Class A biosolids (compost), the compost is then cured for about three to four months for odor reduction. The compost is then sold or given away to the public. If the compost pad does not have space to compost the solids, the solids will be buried in the landfill.

Future Disposal Methods

The SGWRF intends to continue composting biosolids to meet Class A requirements for sale or giveaway, or dispose of the biosolids at the WCL for the life of this permit. If the SGWRF needs, or wants to change their disposal methods, the SGWRF will need to notify the Utah Division of Water Quality, at least 180 days in advance of any changes.

BIOSOLIDS LIMITATIONS AND SELF-MONITORING REQUIREMENTS

Under *40 CFR 503.16(a)(1),* the self-monitoring requirements are based upon the amount of biosolids disposed per year and shall be monitored according to the chart below.

Minimum Frequency of Monitoring	
Dry Metric Tons (DMT) of Biosolids Disposed Per Year	Monitoring Frequency
290 to < 1,500, DMT	Four times per year
1,500 to <15,000	Six times per year

Since the SGWRF sold or gave away 5,311 DMT of Class A biosolids in 2005, they will need to monitor the biosolids at least six times a year for the parameters listed below.

BIOSOLIDS LIMITATIONS

Heavy Metals Limitations

Prior to sale or giveaway to the public, all biosolids need to be sampled and meet the heavy metals limits of *Table 3, 40 CFR 503.13,* for the biosolids to be considered Class A (exceptional quality (EQ)) biosolids in regards to heavy metals. The practice of sale or giveaway to the public is an acceptable use of biosolids of this quality as long as the biosolids continue to meet EQ standards. If the biosolids fail to meet Table 3 of *40 CFR 503.13*, the biosolids cannot be land applied, and the SGWRF will need to dispose of the biosolids in the landfill.

Pathogens, Class A Biosolids

If biosolids are to be land applied to home lawns and gardens, the biosolids need to be treated by a specific process to further reduce pathogens (PFRP), and meet a microbiological limit of less than 1,000 most probable number (MPN) of fecal coliform per gram of total solids (or less than 3 MPN of *Salmonella* per 4 grams of total solids) to be considered Class A biosolids with respect to pathogens. The PFRP will be accomplished through windrow method of composting. *(Using the windrow method of composting, the temperature needs to be maintained at 55 ^{o}C (131 ^{o}F) or higher for fifteen days, with a minimum of five turnings during those fifteen days. (40 CFR 503.32(a)(8), Appendix (B), (B)(1).* The practice of sale or giveaway to the public is an acceptable use of biosolids of this quality as long as the biosolids continue to meet Class A standards with respect to pathogens. If the biosolids do not meet Class A pathogen standards the biosolids cannot be sold or given away to the public, and the SGWRF will need to dispose of the biosolids in the landfill.

Vector Attraction Reduction

The SGWRF needs to meet a method of vector attraction reduction (VAR) if the biosolids are to be sold or given away to the public. Since the biosolids are composted to meet Class A pathogen reduction standards, the biosolids will automatically meet a method of vector attraction reduction *(Aerobic treatment of the biosolids for at least 14 days at over 40^{o}C (104^{o} F) for at least 14 days (40 CFR 503.33, Option 5)*. If the biosolids do not meet Class A vector attraction standards, the biosolids cannot be sold or given away to the public, and the SGWRF will need to dispose of the biosolids in the landfill.

Landfill Monitoring

Under *40 CFR 258,* all biosolids that are land filled will need to pass a paint filter test (to determine if the biosolids exhibit any free liquid). If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1),* and the SGWRF will need find another method of disposal.

MONITORING DATA

Heavy Metals

The SGWRF was required to sample for heavy metals at least six times in 2005. All of the compost sold or given away in 2005 met *Table 3* of *40 CFR 503.13*, therefore, the SGWRF compost qualifies as Class A with respect to metals. The monitoring data is below.

Heavy Metals Monitoring Data, 2005 Compost

Parameter	**Table 3 Limits, mg/kg (Exceptional Quality)**	**SGWRF, Maximum, mg/kg (2005)**	**SGWRF, Average, mg/kg (2005)**
Arsenic	41.0	12.0	6.10
Cadmium	39.0	1.5	1.08
Copper	1500.0	330.0	262.0
Lead	300.0	35.0	16.5
Mercury	17.0	4.7	1.63
Molybdenum	75.0 a/	5.0	2.3
Nickel	420.0	17.0	14.3
Selenium	100.0	5.0	5.0
Zinc	2,800.0	410.0	372.0

a/ 40 CFR 503.13 Table 1

Pathogens

The SGWRF was required to sample for pathogens at least six times in 2005 (one sampling event for fecal coliform consist of at least seven samples) and all seven samples must be below 1,000 MPN/g. The SGWRF had 29 sampling events in 2005 for a total of 207 individual samples for fecal coliform. All of the compost sold or given away in 2005 met the Class A pathogen requirements of *40 CFR 503.32*. The monitoring data shows that the SGWRF passed all 207 individual samples. The monitoring data is below.

Parameter	**Permit Limits** Most Probable Number Per Gram of Total Solids (MPN/G)	**SGWRF Maximum** Most Probable Number Per Gram of Total Solids (MPN/G)	**SGWRF, Geometric Mean of 207 samples** MPN/g
Fecal Coliform (2005)	<1,000 MPN/g	307 MPN/g	<33.0

REPORTING AND RECORD KEEPING REQUIREMENTS

Record keeping

The record keeping requirements from *40 CFR 503.17* are included under *Part II.F*. of the permit. The amount of time the records must be maintained are dependent on the quality of the biosolids in regards to the heavy metals concentrations. If the biosolids continue to meet the heavy metals limits of *Table 3 of 40 CFR 503.13*, and are sold or given away the records must be retained for a minimum of five years. If the biosolids are disposed in a landfill the records also must be retained for a minimum of five years.

Reporting

The SGWRF will need to report annually as required in *40 CFR 503.18*. This report is to include the results of all monitoring performed in accordance with *Part I.C*. of the permit, information on management practices, biosolids treatment, and certifications. This report is due no later than February 19 of each year. Each report is for the previous calendar year.

STORM WATER

STORMWATER REQUIREMENTS

Storm water provisions are included in this combined UPDES permit.

The storm water requirements are based on the UPDES Multi-Sector General Permit for Storm Water Discharges for Industrial Activity, General Permit No. UTR000000 (MSGP). All sections of the MSGP that pertain to discharges from wastewater treatment plants have been included and sections which are redundant or do not pertain have been deleted.

The permit requires the preparation and implementation of a storm water pollution prevention plan for all areas within the confines of the plant. Elements of this plan are required to include:

1. The development of a pollution prevention team:
2. Development of drainage maps and materials stockpiles:
3. An inventory of exposed materials:
4. Spill reporting and response procedures:
5. A preventative maintenance program:
6. Employee training:
7. Certification that storm water discharges are not mixed with non-storm water discharges:
8. Compliance site evaluations and potential pollutant source identification, and:
9. Visual examinations of storm water discharges.

St. George City is currently covered under the UPDES Multi Sector General Permit for Industrial Activities.

PRETREATMENT REQUIREMENTS

The pretreatment requirements remain the same as in the prior permit with the permittee administering an approved pretreatment program. Any substantial changes to the program must be submitted for approval to the Division of Water Quality. Authority to require a pretreatment program is provided for in *19-5-108 UCA, 1953 ann.* and *UAC R317-8-8*.

The permittee will be required to perform an annual evaluation of the need to revise or develop technically based local limits to implement the general and specific prohibitions of *40 CFR, Part 403.5(a)* and *Part 403.5(b)*. This evaluation may indicate that present local limits are sufficiently protective, or that they must be revised.

As part of this evaluation, the permit requires quarterly influent and effluent monitoring for metals and organic toxics listed in *R317-8-7.5* and sludge monitoring for potential pollutants listed in *40 CFR 503.*

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the *State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring).* Authority to require effluent biomonitoring is provided in *Permit Conditions, UAC R317-8-4.2, Permit Provisions, UAC R317-8-5.3* and *Water Quality Standards, UAC R317-2-5* and *R317 -2-7.2*.

Since the permittee is a major municipal discharger, the renewal permit will require whole effluent toxicity (WET) testing. Chronic toxicity testing will be conducted using Ceriodaphnia dubia and Pimephales promelas (fathead minnows), as detailed in the permit. Limits for WET chronic testing will be required and are detailed in the permit. Testing will be quarterly alternating between Ceriodaphnia dubia and Pimephales promelas.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by
Jennifer Robinson, Discharge
Mark Schmitz, Biosolids
Tom Rushing, Storm Water
Utah Division of Water Quality

_____, _____
TMDL Section Date